

application with Claims 14-20 being withdrawn from further consideration by the Examiner.

Attached hereto as Appendix A captioned "Version with Markings to show changes made" is a marked-up version of the changes made to the claims by the current amendment. In addition, for the convenience of the Examiner, all claims now pending following entry of the present Amendment and Response are reproduced in Appendix B captioned "Pending Claims."

Restriction Requirement

Examiner has made the Restriction Requirement final. Notwithstanding Examiner's determination of finality, Applicants again submit that the restriction requirement is improper.

Group I, Claims 1-13, is drawn to an over-coating composition and Group II, Claims 14-19, is drawn to a process of imaging using the composition of Group I. Therefore, both Groups have commonality of the composition of Group I. Thus, in order to determine whether the compositions of Group I are novel, it is necessary to determine whether these compositions have been previously used. Thus, a thorough search for compositions of Group I requires a search for using these compositions as well. Accordingly, it is submitted that all of the claims can be searched simultaneously without serious burden to the Examiner.

Where a single field of search thoroughly covers all of the claims in an application, different classifications in the Patent and Trademark Office should not be controlling. In the present case, the claims of Groups I and II are so closely related as to be capable of examination together. The restriction requirement in this case only serves to increase the prosecution expense to the Applicants and to the Patent and Trademark Office. Therefore, Applicants respectfully request that the restriction requirement be withdrawn.

In the event that the Examiner maintains the Restriction Requirement, Applicants request rejoinder of claims of Group II should the claims of Group I are found

to be allowable. The law is clear that where product claims and a process of using the product claims are presented in the same application, rejoinder of the process of using the product claims is permitted when the product claim is found allowable. See M.P.E.P. §821.04; *In re Brouwer*, 37 USPQ2d 1663 (Fed. Cir. 1996); *In re Ochiai*, 37 USPQ2d 1127 (Fed. Cir. 1995). Thus, when composition claims of Group I are found to be allowable, Applicants request rejoinder of the process for using the composition claims, represented by claims of Group II.

Rejection under 35 U.S.C. §112

Claims 6-11 are rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Office Action states that the terms “derivatives and salts thereof” in Claim 6 are indefinite.

Claim 6 has been amended thereby obviating this rejection.

Claims 7 and 8 are also rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Office Action states that the terms “alkyl” in Claim 7 is indefinite. In particular, it appears the Office Action is alleging that the scope of the term “alkyl” as used in the present application is broader than those recognized by one skilled in the art.

Applicants note that they are permitted to use terms that have uncommon meanings. *Intellicall v. Phonometrics, Inc.* 21 USPQ2d 1383 (Fed. Cir. 1992) (“An inventor can choose to be his own lexicographer to give terms uncommon meanings. If he so chooses he must set out his uncommon definitions in a clear and consistent manner within his patent disclosure.”)

It is submitted that the term “alkyl” is clearly defined in a manner consistent with its usage in the present application. Specifically, the present invention explicitly states that an alkyl group can be optionally substituted with one or more

substituent(s). See for example, page 5, lines 17-25. Accordingly, Applicants respectfully request withdrawal of this rejection.

Claim 11 is also rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Office Action states triethanolamine is not a salt of an amine.

Claim 11 has been amended thereby obviating this rejection.

Rejection under 35 U.S.C. §§102 and 103(a)

A number of rejections were set forth under 35 U.S.C. §§102 and 103(a). In general, the over-coating composition of the present invention is readily distinguished from the cited references.

As an initial matter, it is noted that claims are anticipated if, and only if, **each and every element** as set forth in the claim is found in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051 (Fed. Cir. 1989). Furthermore, "[t]he **identical invention must be shown in as complete detail as is contained in the...claim.**" (emphasis added) *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913 (Fed. Cir. 1989).

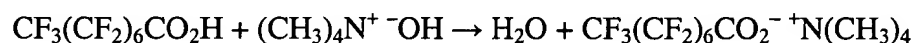
The present invention discloses an over-coating composition for coating a photoresist composition to provide a substantially vertical photoresist pattern. The over-coating composition of the present invention comprises an over-coating resin, a solvent, and a basic compound. As amended, the over-coating resin is derived from acrylic acid, alkyl acrylate, or a mixture thereof.

As discussed in detail below, none of the cited references discloses such a composition. Moreover, none of the cited references suggests, teaches, or provides motivation for making compositions of the present invention.

Rejection based on U.S. Patent No. 5,744,537

Claims 1, 2, 4-10, 12, and 13 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,744,537, issued to Brunsvold et al. (hereinafter the "Brunsvold patent").

Examples 1-3 of the Brunsvold patent, which are cited by the Examiner as allegedly anticipating the present invention, disclose using tetramethyl ammonium perfluorooctanoate, i.e., a salt of the formula: $\text{CF}_3(\text{CF}_2)_6\text{CO}_2^- \text{ } ^+\text{N}(\text{CH}_3)_4$. As Example 1 of the Brunsvold patent discloses, one equivalent (18 g, 99 mmol) of tetramethyl ammonium hydroxide pentahydrate (MW = 181) is reacted with one equivalent (which the Brunsvold incorrectly stated as being 0.1 equiv.) (41 g, 99 mmol) of perfluorooctanoic acid (MW = 414) in water. The resulting product is formation of water and tetramethyl ammonium perfluorooctanoate salt by the following reaction scheme:



Since one equivalent each of tetramethyl ammonium hydroxide pentahydrate and perfluorooctanoic acid is used, the resulting product is a perfluorooctanoic acid-tetraalkylammonium salt with no tetramethyl ammonium hydroxide being present. The anion portion of this salt is $\text{CF}_3(\text{CF}_2)_6\text{CO}_2^-$. While one skilled in the art may consider a non-fluorinated carboxylate anion as being weakly basic, perfluorinated carboxylate anion would not be considered as being basic.

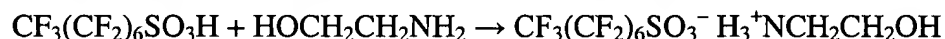
The fluorinated carboxylic acids are much stronger acids than the corresponding non-fluorinated carboxylic acids due primarily to an inductive effect of fluorine atoms. Thus, trifluoroacetic acid is a much stronger acid than acetic acid. In fact, trifluoroacetic has an acid strength similar to hydrochloric acid. Likewise, perfluorooctanoic acid is a much stronger acid than octanoic acid. Similar to chloride ion and sulfonate ions, the anionic form of perfluorooctanoic acid is not considered to be a basic compound. Accordingly, unlike the present invention, antireflective compositions of the Brunsvold patent do not include a basic compound.

Therefore, the 35 U.S.C. §102(b) rejection of Claims 1, 2, 4-10, 12, and 13 based on the Brunsvold patent is improper and should be withdrawn.

Rejection based on U.S. Patent No. 6,132,928

Claims 1, 2, 4-8, 12, and 13 are rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent No. 6,132,928, issued to Tanabe et al. (hereinafter the "Tanabe patent").

Examples 1 and 2 of the Tanabe patent disclose a solution derived from a surfactant and monoethanolamine. In Examples 1 and 2 of the Tanabe patent, 500 g of 20% by weight aqueous solution of perfluorooctylsulfonic acid (100 g, MW = 500, 200 mmol) is mixed with 30 g of 20% by weight aqueous solution of monoethanolamine (6 g, MW = 61, 98 mmol). The resulting product is formation of water and monoethanol ammonium perfluorooctylsulfonate salt by the following reaction scheme:



Since about two equivalents of perfluorooctylsulfonic acid is used per one equivalent of monoethanolamine, the resulting product is monoethanol ammonium perfluorooctylsulfonate salt with no monoethanolamine being present. In fact, excess perfluorooctylsulfonic acid is present in the composition of Example 1 and 2 of the Tanabe patent. The anion portion of the salt that is formed is $\text{CF}_3(\text{CF}_2)_6\text{SO}_3^-$. One skilled in the art does not consider any sulfonate anion as being basic. Accordingly, unlike the present invention, antireflective compositions of the Tanabe patent do not include a basic compound.

Therefore, the 35 U.S.C. §102(e) rejection of Claims 1, 2, 4-8, 12, and 13 based on the Tanabe patent is improper and should be withdrawn.

Rejection based on U.S. Patent No. 5,783,362

Anticipation Rejection

Claims 1, 2, 4-8, 12, and 13 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,783,362, issued to Wakiya et al. (hereinafter the "Wakiya patent"). The composition discussed in Example 1 of the Wakiya patent uses polyvinylpyrrolidone as the resin.

In contrast, the over-coating resin of the present invention is derived from acrylic acid, alkyl acrylate, or a mixture thereof.

Since the Wakiya patent does not disclose every element of the present invention, rejection of Claims 1, 2, 4-8, 12, and 13 under 35 U.S.C. §102(b) based on the Wakiya patent is improper and should be withdrawn.

Obviousness Rejection

Claims 1, 2, and 4-13 are rejected under 35 U.S.C §103(a) as allegedly being unpatentable over the Wakiya patent.

Claims cannot be found obvious unless the prior art **teaches or suggests** making the claimed product. *See In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991) (The teaching or suggestion to make the claimed combination or modification and the reasonable expectation of success must **both be found** in the prior art).

As stated above, the Wakiya patent uses polyvinylpyrrolidone as the resin. The Wakiya patent does not provide any motivation, suggestion or teaching to use an over-coating resin derived from acrylic acid, alkyl acrylate or a mixture thereof.

Accordingly, the rejection of Claims 1, 2, and 4-13 under 35 U.S.C. §103(a) is improper and should be withdrawn.

Rejection based on U.S. Patent No. 5,611,850

Claims 1, 2, 4-10, 12, and 13 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Patent No. 5,611,850, issued to Nishi et al. (hereinafter the “Nishi patent”).

Examples 5 and 14 of the Nishi patent which are cited by in the Office Action as allegedly anticipating the present invention discuss an anti-reflective coating composition that are “prepared by mixing a salt of heptadecafluorooctanesulfonic acid **neutralized** with a tetramethylammonium hydroxide aqueous solution..., a salt of perfluoroalkylpolyethercarboxylic acid...neutralized with a tetramethylammonium hydroxide aqueous solution....” See Preparation Example 5 on Col. 7, lines 55-61. Since tetramethylammonium hydroxide is neutralized with acid, the resulting composition does not contain any basic compound. Accordingly, the Nishi patent does not disclose all the elements of the present invention.

Therefore, it is submitted that the rejection of Claims 1, 2, 4-10, 12, and 13 under 35 U.S.C. §102(b) based on the Nishi patent is improper and should be withdrawn.

Rejection based on EP 1 026 208

Claims 1, 2, 4-10, 12, and 13 are rejected under 35 U.S.C. §102(a) as allegedly being anticipated by Takano et al., EP 1 026 208, (hereinafter the "Takano EP Application").

The Takano EP Application discusses a composition for reflection reducing coating which has a pH value of 1.3 to 3.3. See the Abstract. This pH value indicates that the composition is acidic. Therefore, any organic amine that is present in the composition discussed in the Takano EP Application is neutralized by the perfluoroalkylsulfonic acid. Thus, in effect there is no basic compound present in the composition discussed in the Takano EP Application.

Since the present invention requires the presence of a basic compound, not every element of the present invention is disclosed in the Takano EP Application. Accordingly, the rejection of Claims 1, 2, 4-10, 12, and 13 under 35 U.S.C. §102(a) based on the Takano EP Application is improper and should be withdrawn.

Rejection based on WO 95/10798

Claims 1, 2, and 4-13 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Jain et al. (PCT Publication No. WO 95/10798) (hereinafter the "Jain reference"). Specifically, the Office Action states that Examples 2-9 of the Jain reference anticipate the present invention.

Examples 2-9 of the Jain reference discusses a formulation comprising tetramethylammonium salt of pentadecafluorooctanoic acid (Example 2), the amine salt of perfluorooctanosulfonic acid (Examples 3, 4, 6, and 9), ammonium perfluorooctanoate (Example 5), and tetramethyl ammonium salt of perfluorooctanoic acid (Examples 7, 8). These salts are not basic compounds. The amine compounds in these examples have been neutralized and converted to their respective conjugate acids. Thus, in effect these

are acidic compounds not basic compounds that are present in the compositions discussed in the Jain reference.

In contrast, the compositions of the present invention requires the presence of a basic compound. Accordingly, the rejection of Claims 1, 2, and 4-13 under 35 U.S.C. §102(b) based on the Jain reference is improper and should be withdrawn.

Rejection based on JP 02-263811

Claims 1 and 3 are rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Tomihari et al. (JP 02-263811) (hereinafter the "Tomihari Abstract").

It is unclear from the Tomihari Abstract what the exact composition is. Moreover, the Tomihari Abstract discusses adding "alkali (e.g., ammonia) in an amount required to neutralize an acid component of the prepared copolymer...." Thus, the alkali component is no longer present in the composition. Only its conjugate acid is present.

Accordingly, no basic compound is present in the composition discussed in the Tomihari Abstract.

Moreover, it is well known that Abstracts are often misleading or can be misinterpreted. While not binding, the Board of Patent Appeals and Interferences has recently stated that "the preferred practice is for the examiner to cite and rely on the underlying document." *Ex parte Gavin* 62 USPQ2d 1680 at 1684 (Board of Patent Appeals and Interferences 2002). If the Examiner insists on relying on the Tomihari Abstract, Applicants specifically request that the Examiner provide a translated underlying document so that Applicants can examine the entire reference.

Notwithstanding the Examiner's failure to provide a translated underlying document of the Tomihari Abstract, Applicants' preliminary analysis reveal that the underlying Tomihari reference is directed to a coating material, especially for protecting the surface of various kinds of vehicles or machine parts. This coating composition is believed to be water paint. Since the present invention is directed to an over coating composition for photoresist composition, it is submitted that the overall composition disclosed in the Tomihari reference is different from the present invention.

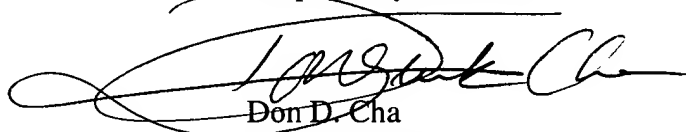
Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §102(b) rejection of Claims 1 and 3 based on the Tomihari Abstract.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted,



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APPENDIX A
VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claims 1, 6, 9-11, and 15 have been amended as follows:

1. (Amended Herein) An over-coating composition for coating a photoresist composition to provide a vertical photoresist pattern, said over-coating composition comprising an over-coating resin **derived from acrylic acid, alkyl acrylate, or a mixture thereof**, a solvent, and a basic compound.

6. (Amended Herein) The over-coating composition according to Claim 1, wherein said basic compound is selected from the group consisting of an amine compound **and a hydroxy salt thereof**; an amide compound; a urethane compound; ~~derivatives and salts thereof;~~ and ~~mixtures~~ **a mixture** thereof.

9. (Amended Herein) The over-coating composition according to claim 6, wherein said amine compound is selected from the group consisting of L-proline, **a tetraalkylammonium hydroxide salt, a tri(hydroxyalkyl)amine** ~~tri(hydroxyalkyl)ammonium salt,~~ and ~~mixtures~~ **a mixture** thereof.

10. (Amended Herein) The over-coating composition according to claim 9, wherein said tetraalkylammonium **hydroxide** salt is selected from the group consisting of tetramethylammonium hydroxide and tetramethylammonium hydroxide pentahydrate.

11. (Amended Herein) The over-coating composition according to claim 9, wherein said **tri(hydroxyalkyl)amine** ~~tri(hydroxyalkyl)ammonium salt~~ is triethanolamine.

15. (Amended Herein) The process according to claim ~~12~~ **14**, wherein said photoresist composition comprises a chemically amplified photoresist resin.

New Claim 21 has been added as follows:

21. (New) A method for producing a substantially vertical photoresist pattern during a photolithography process, said method comprising coating an over-coating composition of Claim 1 to a substrate on top of a photoresist composition layer prior to subjecting the substrate to a photolithography process.